INVESTIGATING THE ROLE OF PHYTOPLANKTON IN FLOCCULATION OF SUSPENDED MATTER IN ESTUARIES

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Pure cultures of *Scenedesmus obliquus* and sediment suspensions (kaolin and estuarine sediments) were incubated in rolling cylindrical tanks to study the influence of phytoplankton on the flocculation of sediments. The sets of experiments performed included: 1) varying concentrations of phytoplankton (0, 0.5, 2.0 and 6.0mg DW l -1) and sediments (30, 100 and 200mg DW l -1) and 2) treatments investigating the effects of phytoplankton on sediment flocculation (at a given phytoplankton and sediment concentration), and modification of flocculation by EDTA and salinity. The floc size and the number of flocs were estimated using image analysis. Factorial regression was used to analyse the first sets of experiments while one way ANOVA was used to determine significant difference between groups for the second. Post hoc comparisons (Scheffe test) were done for significant ANOVA results. Our results showed that roller tank incubations and image analysis may be a useful tool to study the effects of phytoplankton on flocculation of clay or sediment suspensions. *Scenedesmu*s seems to have an influence on flocculation of kaolin clay suspensions, although this influence was difficult to demonstrate due to the poor experimental control over kaolin flocculation in control treatments. In the estuarine sediment suspensions, *Scenedesmus* had no or only a weak effect on flocculation, probably because estuarine sediments were already rich in organic matter, which stimulates flocculation. EDTA had no significant effect on flocculation of kaolin and estuarine sediments, although floc size tended to be slightly lower in the presence of EDTA. Salinity significantly increased the number of flocs in both kaolin and estuarine sediment suspensions.

References

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